

Linn. Soc., Zool. xxiii. pls. iii., iv.). Labial palpi 4-jointed, first joint at least as long as the other three together, 3 shortest, 2 hardly longer, 4 narrow and very little longer than 2. Maxillary palpi 6-jointed; the joints subequal, 5 shortest.

The known species may be separated thus:—

A. Large species:

- (1) Stigma ferruginous *P. mexicanorum*, Ckll. (Mexico.)
 (2) Stigma dark *P. asclepiadis*, Ckll. (New Mexico,
 Colorado; also Fedor, Texas, as I
 learn from Mr. Fox.)

B. Small species:

- (1) Tarsi piceous in ♀ *P. trifoliata*, Ckll. (New Mexico.)
P. maurula, Ckll. (Texas.)
 (2) Tarsi rufous in ♀, yel-
 lowish white in ♂ *P. heteromorpha*, Ckll. (New Mexico.)

It is not worth while to give the full distinguishing characters here, as they are given in connexion with the detailed descriptions.

Mesilla, New Mexico, U.S.A.,
 June 2, 1896.

XII.—*Description of a new Species of the Leaf-footed Centipede (Alipes) from Nyasaland, together with Notes upon the previously described Species of the Genus.* By R. I. POCKOCK.

THE generic synonymy of this interesting centipede, as first pointed out, I believe, by Kohlrausch (Arch. Nat. 1881, pp. 76-77), is as follows:—

ALIPES, Imhoff, Verh. naturforschenden Ges. Basel, i. p. 120, pl. i., Sept. 4th, 1854. (Type *multicostis*, Imh.)

EUCORYBAS, Gerstaecker, Stettin. ent. Zeitsch. xv. p. 309, pl. ii. fig. 1, Oct. 1854. (Type *crotalus*, Gerst.)

The three species of the genus that have been hitherto established appear to me to be readily recognizable forms, though most authors seem willing to admit only two of them. To these three a fourth has here been added.

Alipes multicostis, Imhoff.

Alipes multicostis, Imhoff, *op. cit.* p. 120, pl. i.

This species was originally recorded from the Gold Coast, on the Gulf of Guinea, and specimens of presumably the

same species have since been acquired from Sierra Leone and the Cameroons (*vide* Porat, Bih. Sv. Vet.-Akad. Handl. xx. pt. ii. no. 5, p. 15, 1895). The British Museum has examples from Cape Palmas (*Alvan Millson*) and the Cameroons (*Johnston*) which, without much doubt, are also to be referred to this species.

The specimens from the Cameroons are in a good state of preservation. The largest measures 120 millim. in length and 7.5 in width, the anal leg being 36 long, or as long as the last six segments and part of the seventh; the head and first three segments are a deep blackish green, while the rest are reddish brown with a green stripe along the hinder border, and the legs are a bright ochre-yellow, except the anterior three pairs, which are tinted with green. The second specimen, measuring 78 millim. long and 4.8 wide, with the anal leg 28, resembles the large one in a general way as regards colour, except that the anterior half of the body is greener and there is no transverse stripe on the posterior border of the posterior tergites. Again, the crests and spicules on the tergites are stronger than in the large individual, a fact which seems to show that these structures wear down with age. So, too, the grooves and spicules on the legs become less pronounced with increase of size. The two specimens from Cape Palmas are of smaller size (62 millim.) and are of a uniform deep green colour. In these, again, the sculpturing is coarse, but unfortunately they have no anal leg.

This species may be distinguished by the form of the anal legs; the expansions of the tibiæ are of very large size, both rise from the anterior end of the segment, and though the lower has a more convex margin, it is not larger at its distal end; the distance between these points is nearly equal to the length of the segment along the middle line; the height of the protarsus is about five sixths of its median length, or, in the small specimen, rather less, while the height of the tarsus is about four fifths of its length (fig. *a*, p. 96).

Alipes crotalus (Gerst.).

Eucorybas crotalus, Gerstaecker, *op. cit.* p. 309, pl. ii. fig. 1.

Recorded originally from Natal, whence the British Museum has received three examples collected by Gueinzus, one by Mr. Plant, and one by Colonel Bowker. All these examples agree closely with Gerstaecker's figure and description, and are no doubt co-specific with his specimen. Fortunately all of them are provided with the anal legs, so that it becomes possible to test the constancy of the features

presented by these organs. The length of the largest specimen is 64 millim. and the width 5, and in an example preserved in alcohol, measuring 61 millim., the width is just under 5. The width is thus more than one thirteenth of the length, whereas in the examples of *multicostis* mentioned above the width is about one sixteenth of the length, so that, even making due allowance for variation in this respect owing to longitudinal shrinkage, it may be said that on the whole *crotalus* is stouter than *multicostis*. A further distinction seems to be found in the sculpturing of the terga, the sutural crests being much stronger as compared with the one in the middle line in *crotalus*. The colour, too, of the specimens of *crotalus* is less green, being rather of a deep pinkish brown. I do not, however, find that the features mentioned by Lucas to distinguish *Grandidieri* from *crotalus* hold good. The impressions or spots on the first tergite, for example, are scarcely distinguishable, and the excavation of the inner surface of the patella of the anal leg is attributable to drying. In one example, for instance, the excavation is present on one leg but not on the other. It is, however, by the anal leg, which sometimes exceeds the length of the posterior seven body-segments, that *crotalus* may be most readily distinguished from *multicostis*. In the former the two expansions of the tibia are smaller and rise further back, but the distance between the terminal points is nearly equal to the median length of the segments. The protarsal and tarsal laminae are, on the other hand, larger than in *multicostis*, the tarsus being nearly as high as it is long. The latter is often armed at the tip with a minute claw (fig. *b*, p. 96).

Alipes Grandidieri (Luc.).

Eucorybas Grandidieri, Lucas, Ann. Soc. Ent. Fr. (4) iv. p. 420 (1864);
id. *op. cit.* (5) i. pp. 448-451, pl. vii. figs. 1-7 (1871).

This species, recorded originally from Zanzibar, appears to me to be quite distinct, as Lucas surmised and other authors seemingly admit, from the Natal form *crotalus* of Gerstaecker. Apart from the other differential characters pointed out by Lucas, the relatively small size of the laminate expansions on the anal legs are sufficiently diagnostic. So, too, does it seem to me, in spite of the contrary opinion advocated by both Gerstaecker (Von der Decken's 'Reisen in Ost-Afrika,' iii. 2, p. 524) and von Porat (Bih. Sv. Vet.-Akad. Handl. xx. pt. ii. no. 5, p. 15), that *Grandidieri* must also be regarded as distinct from the West-African species *multicostis*, Imhoff, the figure of which, judging from specimens in the British

Museum, is very fairly accurate, and from which it appears that the laminate expansions of the anal tibia are larger even than in *crotalus*, so that the height of this segment at its distal end measured from angle to angle is nearly equal to its median length. Lucas, moreover, describes his specimen as having the dorsal surface very obsoletely granulate; but the value of this statement depends upon whether or not the describer was personally acquainted with the granulation of other species of the genus.

Alipes appendiculatus, sp. n.

Colour a dull olive-green, antennæ and legs yellow; head tinted with ochre.

Head a little wider than long ($5:4\frac{1}{2}$), semielliptical, sparsely punctured, and weakly bi-impressed.

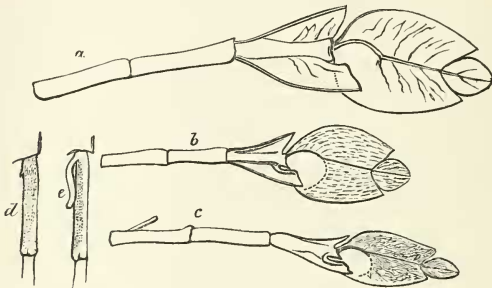
Antennæ moderately long, composed of 17 or 18 segments, whereof the basal three are naked and the rest pubescent; the apical not longer than the penultimate.

Maxillipedes also sparsely punctured; coxal plate marked in front with a median abbreviated sulcus and two obliquely transverse lateral sulci; precoxal plates of medium size, separated, each armed with 4 conical teeth; femoral tooth strong.

Terga.—First and second smooth or spicular, sparsely punctured; third to twenty-first covered with spicules, which increase in quantity towards the hinder end of the body, also carinate, the anterior ones less strongly than the middle and posterior, though on the fifth the seven longitudinal crests are distinctly visible, the crests placed as follows:—one median, two sutural (one for each longitudinal sulcus), two marginal—that is, the normal marginal elevation,—and two, one on each side between the marginal and sutural, of irregular shape and formed by a fusion of tubercles; on the fifth, seventh, eighth, tenth, twelfth, fourteenth, sixteenth, and eighteenth, but indistinct on the anterior and posterior of these, there is an oblique crest on each side passing anteriorly from the marginal to the sutural; in the middle and posterior part of the body the marginal crest is notched, so as to be almost bitubercular at its hinder end; the sutural crests increase in strength towards the hinder end, terminating on the twentieth segment in an upstanding tubercle; the median crest only a little narrower and lower than the sutural crests in the middle of the body; the lateral crests become gradually obsolete posteriorly and are scarcely visible on the twentieth.

Sterna smooth, sparsely punctured, marked with three obsolete impressions, two lateral and one posterior median.

Anal somite.—*Tergite* with strongly raised margins, not otherwise crested, but thickly granular; *pleurae* densely porous throughout, produced into a blunt unarmed process; *legs* about as long as the last seven body-segments; the femur and patella cylindrical, about four or five times as long as thick, densely spicular, especially the femur on its inner surface at the base, the patella nearly smooth posteriorly; the inner side of the femur at the base armed in one specimen (♀?) with a short spiniform tubercle, in the other (♂?) with a long, cylindrical, smooth process, which curves backwards and extends just beyond the middle of the segment; the



- a. Anal leg of *Alipes multicostis*, $\times 2$.
 b. Anal leg of *Alipes crotalus*, $\times 2$.
 c. Anal leg of *Alipes appendiculatus*, $\times 2$.
 d. Femur of anal leg of *Alipes appendiculatus* (♀), $\times 2\frac{1}{2}$.
 e. " " " " (♂), $\times 2\frac{1}{2}$.

upper plate of the tibia rising in the middle of the segment, but small, ending in an acutely angular prominence, which is less than half the size of the extremity of the inferior plate; the latter rises at the base of the segment and ends in a three-sided process overlapping the base of the succeeding segment; the total height of the tibia at its posterior extremity is a little greater than half the length of the segment; first tarsal (protarsal) segment not quite twice as long as high, with evenly convex upper and lower edges; the median thickening of the segment lightly curved and thicker in its basal third; the surface of the segment distinctly roughened with tubercles; the tarsus without trace of claw, its height two thirds of its length, its posterior width about four fifths the length of the tarsus; tarsus an elongate oval, its height less than two thirds of its length, no claw (figs. c, d, e).

Legs finely spicular above and laterally, like the terga, but less thickly, the posterior more so than the anterior; the upperside of the patella and tibia longitudinally grooved; a tarsal spur on the anterior eight (or fewer) pairs, also an anterior tarsal spur, on the anterior four pairs an anterior tibial spur, and on the first pair an anterior patellar spur.

Length (♀) 95 millim., width 6·5, length of anal leg 30, height of protarsus 4·5; length (♂) 85, width 5·5, length of anal leg 28·5, height of protarsus 4.

Loc. Zomba, 3000-9000 feet (types), Milangi, both in Nyasaland (*Sir H. H. Johnston*).

Three examples were obtained at Zomba and one at Milangi; the smallest of those from Zomba, measuring 71 millim. in length, has lost its anal legs, but it is noticeable that the sculpturing of the terga is coarser, the spicules appearing on the first tergite, whereas in the largest specimen they do not set in until the third; there is, moreover, a distinct median crest on the last tergite, of which the largest specimen shows no trace. The Milangi example has also lost these appendages, but it agrees with the type in other respects; its length is 83 millim.

This species seems to differ from all the previously described forms in the fact that its anal legs are furnished either with a long process or with a spiniform tubercle in its place; none of the other specimens of the genus in the British Museum show a trace of these structures, and no mention of such appears to have been made in literature. Apart from this, the anal legs seem to closely resemble those of *A. Grandidieri*, the type of which, judging by the length, 56 millim. (possibly including the anal legs), was not full-grown. It is necessary, therefore, to bear in mind the possibility of *A. appendiculatus* proving to be the adult of *A. Grandidieri*—a conclusion rendered to my mind still more probable by the fact that a specimen of this genus in the British Museum from Mombasa, which on geographical grounds might be expected to be the same as *Grandidieri*, does not present any features by which it may be separated from *appendiculatus*; but, unfortunately, its anal legs are gone, so that the organs that offer the best specific features cannot be compared. The length of this specimen is 68 millim., and its head is as long as wide, so that in these respects it comes between *Grandidieri* and *appendiculatus*.

In the absence of an armature of spines from the lower surface of the anal femora, as well as in the bluntly ended unarmed anal pleuræ, the genus *Alipes* resembles the genus *Parotostigmus*, Poc. (*Biol. Centr.-Amer.*, Chilopoda, p. 25,

Jan. 1896). It is, further, interesting to note that this new species in its remarkable sexual character approaches the South-American *Parotostigmus scabricauda* (Humb. & Sauss.).

Synopsis of the known Species of the Genus.

- a. Femur of the anal leg with a tuberculiform spine (? ♀) or a long curved process at its base on the inner side (? ♂); the plates upon distal segments relatively small, apparently very much as in *Grandidieri* *appendiculatus*, sp. n. (Nyasaland.)
- b. Femur of anal leg armed neither with a spine nor a process.
- a¹. Crests on the tibia of anal leg small, their height from point to point equal to only about half the median length of the segment; height of protarsus similarly much less than its median length; tergal plates very obsoletely granular (*teste* Lucas) *Grandidieri*, Lucas. (Zanzibar.)
- b¹. Crests on the tibia of anal leg much larger; height of segment from angle to angle nearly equal to its median length; protarsus also nearly as high as long (at least in the adult); tergal plates thickly studded with spicules.
- a². Stouter form, the sutural crests on the terga very much larger than the median; tibial expansions of the anal leg smaller as compared with those of the protarsus, so that the height of the former is only about two-thirds the height of the latter. *crotalus*, Gerst. (Natal.)
- b². Slenderer form, the median tergal crest not very much smaller than the sutural crests; tibial expansion of anal leg relatively larger and the protarsal smaller, the height of the former being about five-sixths that of the latter *multicostis*, Imhoff. (Gold Coast, Cameroons.)

In addition to the specimens mentioned above the British Museum has others which, having lost their anal legs, as so often happens, it is not possible to identify. Two of these from Kinyamholo, Lake Tanganyika (*W. H. Nutt*), are of great interest on account of the weakness of the wrinkles, crests, and spicules on the terga. It is only in the posterior half of the body, in fact, that this sculpturing is at all strong. These specimens are the only ones seen by me which, as compared with the rest of the genus, fall in with Lucas's definition "très-obsoletement granulée." It is, of course, very possible

that they will prove to be referable to *Grandidieri*. There is also the unidentifiable specimen from Mombasa referred to above and one from South Africa (? West Africa), probably belonging to *multicostis*, obtained by Capt. Burton.

From considerations of geographical distribution I should be inclined to think that the specimen from Caffraria, described by Porat as *Grandidieri*, will prove to belong to *crotalus* (Æfv. Vet.-Akad. Förhandl. 1871, p. 1162).

XIII.—*A Question concerning a British Pagurid.* By JAMES E. BENEDICT, Assistant Curator, Department of Marine Invertebrates, U.S. National Museum.

BRITISH naturalists have not recognized *Pagurus Kröyeri**, Stimpson, as a valid species. They refer it to *P. pubescens*, Kröyer, or, as Mr. Henderson has done, call it *pubescens*, var. *Kröyeri*. On this side of the Atlantic the species is recognized as distinct from *pubescens*. *P. Kröyeri* and *P. pubescens* are quickly and accurately separated not by the pubescence, abundant on the one and comparatively inconspicuous on the other species, but by the marked difference in the form of the left hand, as the most obvious character (see figs A and B, p. 100). The idea that British naturalists cannot as readily see these characters with both species before them is not to be entertained. We must look further for the explanation. Prof. S. I. Smith says †:—“Kröyer’s figure in Gaimard’s ‘Voyages en Scandinavie,’ Crustacés, pl. ii. fig. 1, evidently represents the *Kröyeri*, although the tubercles upon the chelipeds are represented in the figures as a little too large and more scattered than in any specimens I have seen; but this is probably due to a slight and very natural inaccuracy on the part of the artist or engraver; the original description of *Pagurus pubescens* (‘Naturhistorisk Tidsskrift,’ ii. p. 251, 1839), however, applies best to the other species, which Kröyer evidently had before him when writing the first phrase of the diagnosis—‘cephalothoracis superficie dorsali pedibusque pilis flavis dense obsitis’—which would not apply to any specimens of *Kröyeri* or to his figure published ten years after. Kröyer

* It seems necessary to change the name of the group of which *Bernhardus* is the type to *Pagurus*. I believe that the genus *Pagurus*, as now constituted, does not contain a single one of the original species placed in it by Fabricius; but, be that as it may, a valid and therefore imperative reason for making the change lies in the fact that *Bernhardus* was designated as the type of *Pagurus* by Latreille in 1810 (Consid. Génér. Crust. p. 421).

† Trans. Conn. Acad. v. p. 49.